

U.S. Pat. Appl. Ser. No. 10/546,625  
Attorney Docket No. 12841/6  
Reply Brief

[12841/6]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS AND INTERFERENCES**

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In re Application of: :  
 : Examiner: Peter D. NOLAN  
Falk HECKER et al. :  
 :  
 :  
For: METHOD AND DEVICE FOR EFFECTING :  
A COMPUTER-AIDED ESTIMATION OF :  
THE MASS OF A VEHICLE, :  
PARTICULARLY OF A COMMERCIAL :  
VEHICLE :  
 :  
 :  
Filed: February 27, 2006 : Art Unit: 4155  
 :  
Serial No.: 10/546,625 :  
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MAIL STOP APPEAL BRIEF - PATENTS  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

I hereby certify that this correspondence is being electronically  
transmitted to the United States Patent and Trademark Office via  
the Office electronic filing system on May 4, 2010.  
Signature: /Marcello M. Petrone/

**REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41**

SIR:

Appellants submit the present Reply Brief in response to the Answer of March 4, 2010, for which the two-month reply brief due date is May 4, 2010.

It is respectfully submitted that the final rejections of pending claims 13 to 30 should be reversed for the reasons explained below.

## **ARGUMENTS**

### **THE OBVIOUSNESS REJECTIONS OF CLAIMS 13 TO 17, 21, 22, 24 & 25**

Claims 13 to 17, 21, 22, 24 and 25 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,347,269 to Hayakawa et al. in view of U.S. Patent No. 4,773,013 to Crapanzano et al.

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must not be based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

As clearly indicated by the Supreme Court in the *KSR* decision, it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *See KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). In this regard, the Supreme Court further noted that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, at 1396. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

### **CLAIMS 13 TO 17, 21, 22, 24 & 25**

As to claim 13, it is respectfully submitted that the applied references do not disclose nor suggest the feature of an assumption of a constant gradient angle when estimating the vehicle mass as a function of time, as provided for in the context of the claimed subject matter. The present Specification (at page 3, lines 15-31) specifically discloses in this regard that when a vehicle is traveling along any route, gradient angle  $\alpha$  of the roadway is a function of time  $t$  and if one assumes the change in gradient angle  $\alpha(t)$  is very small in time

interval  $dt$  considered, the influence of gradient angle  $\alpha(t)$  may be assumed to be constant for a time, so that gradient angle  $\alpha$  may not have to be estimated, calculated or measured by a cost-creating sensor.

The Hayakawa reference does not disclose or suggest the feature in which *the gradient angle is assumed to be constant*, as provided for in the context of the presently claimed subject matter. (See Hayakawa, col. 6, lines 1-4). The Final Office Action (at page 2) conclusorily asserts that “Hayakawa shows that the gradient angle change *is assumed to be very small* during a time interval, therefore the influence of the gradient *may be assumed to be constant* for a time”. However, assuming that the variation is very small is not the same as assuming that there is no variation (constant). Furthermore, in the Answer at pg. 20 it is conclusorily asserted that the present specification (at page 3, lines 15-31) discloses that if one assumes the change in gradient angle of the roadway is very small during the time interval considered, the influence of gradient angle may be assumed to be constant for a time. This, however, is clearly improper hindsight reasoning based on the Applicants’ own disclosure. In any case, the Answer draws the wrong conclusion, namely that an assumption of a constant gradient, as defined by applicant, is actually an assumption of a very small gradient variation. (*Id.*) The cited portion of the present application can not redefine the plain meaning of the claim language “assuming a constant gradient angle” because it does not even refer to an assumption of a constant gradient angle, but rather it refers to an assumption that **may** be made, of a constant influence of the gradient angle.

Therefore the presently claimed subject matter includes the feature of assuming a constant gradient angle and the Hayakawa reference does not, as is clear from the sections of Hayakawa (cited at pages 2 and 3 of the Final Office Action, and pgs. 20-21 of the Answer), which assert that (according to Hayakawa) for certain roads and speeds, frequency components related to a change in gradient are those of merely 2 Hz -- whereas the variation of the driving force contains components of 2 Hz or higher. Thus, in the Hayakawa device, a high-pass filter is required to remove the signal components below 2 Hz.

As explained above, if the gradient angle is assumed to be constant, as in the presently claimed subject matter, the gradient angle would not have to be estimated, calculated or measured by a cost-creating sensor. In this regard, the high-pass filter of Hayakawa “measures” the variation in the gradient angle to determine if it is significant enough to include in the vehicle mass calculation. It is therefore respectfully submitted that assuming

that there is a small gradient variation simply does not correspond to assuming that there is a constant gradient. The Answer (at pg. 21) asserts that the high-pass filter of Hayakawa does not measure the variation in the gradient, but eliminates the effect of the small change in the gradient on the acceleration and driving force signals by removing the components of these signals caused by the small (i.e. less than 2Hz) assumed variation in the gradient. However, by only removing the effect of the small change in the gradient on the acceleration and driving force signals, the high-pass filter of Hayakawa is effectively measuring the changes in the gradient angle to determine if they are significant enough to include in the vehicle mass calculation and doing so if the effect on the acceleration and driving force signals from the change in the gradient angle is greater than 2Hz.

The Office Actions to date and the Answer also cite the text at col. 5 (lines 5 to 15) of the Hayakawa reference. This text refers to an equilibrium relationship in which  $\Theta$  *represents the change in the gradient*. Therefore, the Hayakawa reference does not disclose nor suggest an equilibrium relationship, as between a motive force and a sum of an inertial force and drive resistances, in which the mass and a gradient angle of a roadway are included as quantities, with respect to time, assuming a constant gradient angle, as provided for in the context of the claimed subject matter. The Answer (at pg. 22) conclusorily asserts that  $\Theta$  can also represent other variables. However, this does not affect the fact that the Hayakawa reference does not disclose nor suggest an equilibrium relationship, as between a motive force and a sum of an inertial force and drive resistances, in which the mass and a gradient angle of a roadway are included as quantities, with respect to time, assuming a constant gradient angle. This is because the cited equation in the Hayakawa reference can include the influence of the gradient resistance which was not removed by the high-pass filter.

The Office Actions to date and the Answer also assert that “If a cutoff frequency greater than the frequency of the gradient variations is selected, such as 2 Hz,  $\Theta$  is eliminated or minimized”. As asserted, inherency concerns anticipation and not obviousness. In any event, to the extent that the Office may be relying on the inherency doctrine, it is respectfully submitted that to rely on inherency, the Office must provide a “basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flows from the teachings of the applied art.” (See M.P.E.P. § 2112; emphasis in original; and see Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int’f. 1990)).

The M.P.E.P. and the case law make clear that simply because a certain result or characteristic **may occur** in the prior art does not establish the inherency of that result or characteristic. In this regard, the Office has specifically asserted that  $\Theta$  is eliminated or minimized only “If a cutoff frequency greater than the frequency of the gradient variations is selected.” Thus,  $\Theta$  will not necessarily be eliminated or minimized, so that an equation containing  $\Theta$  simply does not **necessarily** correspond to an equation without  $\Theta$  as a **variable**.

The Answer (at pg. 22) asserts that Hayakawa (at col. 6, lines 23-25) somehow provides that the cut-off frequency is not limited to 2Hz and that it can be appropriately determined based on the results of experimental trials. However, this does not affect the fact that the cited equation from the Hayakawa reference contemplates the possibility of the change in the gradient angle being significant enough to include in the calculations. This is the exact opposite of assuming that there is no change in the gradient angle as in the presently claimed subject matter. Accordingly, the Hayakawa reference does not disclose nor suggest an equilibrium relationship, as between a motive force and a sum of an inertial force and drive resistances, assuming a constant gradient angle, as provided for in the context of the presently claimed subject matter.

Similarly, the Office Actions to date (cite the text at col. 6, lines 26 to 41) of the Hayakawa reference, which refers to equation (5). According to the Office, this equation can be solved for “m” instantly by “neglecting e(k) in which case equation (5) is equivalent to the equation in claim 16”. However, as explained above, this is not the same as assuming that the gradient is constant. (See col. 6, lines 37 to 39 of Hayakawa which refers to two separate possibilities: “In the case that the residual error e(k) is neglected”; and “In the case that the residual error e(k) is not negligible”).

Thus, e(k) will not necessarily be eliminated, so that an equation containing e(k) does not necessarily correspond to an equation without e(k) as a variable. Therefore, the Final Office Action and Answer essentially acknowledge that an element of the cited Hayakawa reference (equation (5)) is not necessarily like that of the presently claimed subject matter in which the gradient angle is assumed to be constant (equation of claim 16), and is in fact similar to the presently claimed subject matter only if e(k) is neglected, which is not necessarily the case because the assumption of a constant gradient is nowhere disclosed in the Hayakawa reference.

In short, the Office's conclusory assertions that it would somehow be obvious to solve the equation for instances where the variation in road gradient is negligible and can be ignored is wholly unsupported. In particular, *it does not correspond to assuming that the gradient angle of the road will be constant as in the context of the presently claimed subject matter.*

The Office Actions to date and the Answer have conclusorily asserted that the assumption of a constant gradient somehow corresponds to the assumption of a small change in the gradient as in the Hayakawa reference. However, as explained at MPEP 2144.06, to rely on equivalence as a rationale supporting an obviousness rejection, it must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. In re Ruff, 256 F.2d 590, 118 USPQ 340 (CCPA 1958). None of the cited references disclose or suggest that an assumption of a small change of gradient angle is equivalent to an assumption of no change at all.

As to claim 24, it includes features like those of claim 13, and it is therefore allowable for essentially the same reasons as claim 13.

Accordingly, claims 13 and 24, are allowable, as are their respective dependent claims 14 to 17, 21, 22 and 25.

#### **THE OBVIOUSNESS REJECTIONS OF CLAIMS 18 TO 20, 26, 27 & 29**

Claims 18 to 20, 26, 27 and 29 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano and further in view of U.S. Patent No. 6,164,357 to Zhu et al.

#### **CLAIMS 18 TO 20, 26, 27 & 29**

Claims 18 to 20 and 26 depend from claims 13 and 24 and they are therefore allowable for the same reasons, since Zhu does not cure – and is not asserted to cure -- the critical deficiencies of the Hayakawa reference.

**THE OBVIOUSNESS REJECTION OF CLAIM 23**

Claim 23 was rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano et al. and further in view of U.S. Patent No. 6,745,112 to Mori, “Floating-Point Computation Using a Microcontroller” by Randel et al., “Programming and Customizing the PIC Microcontroller” by Predko and U.S. Patent No. 6,567,734 to Bellinger et al.

**CLAIM 23**

Claim 23 depends from claim 13 and it is therefore allowable for the same reasons, since the added references do not cure – and are not asserted to cure -- the critical deficiencies of the Hayakawa reference.

Furthermore, contrary to the assertions in the Final Office Action, it is respectfully submitted that it would not have been obvious to calculate the reciprocal value of the mass in the Hayakawa reference. According to the Office Actions to date and the Answer, the Randal and Predko references supposedly indicate that “in situations where a value is repeatedly used as a divisor, it is more efficient to determine the reciprocal value and use it as a multiplier”. (See Office Action of September 15, 2008 at page 11 (emphasis added)). Since, however, Hayakawa does not involve calculations where the mass is repeatedly used as a divisor, using a technique for reducing the computational load, by using the reciprocal value of the mass when repeatedly using mass as a divisor, is not an obvious choice for improving the overall operational efficiency of systems for estimating the mass of a vehicle such as in Hayakawa. Accordingly, claim 23 is allowable for this further reason. In the Answer, at pg. 26, it is asserted that in Mori the vehicle mass is used as a divisor several times. However, this does not affect Applicants’ argument that Hayakawa *does not involve calculations where the mass is repeatedly used as a divisor* and therefore it would not be obvious to add something (calculations of reciprocal values of mass) that is intended to aid in *calculations where the mass is repeatedly used as a divisor*.

**THE OBVIOUSNESS REJECTIONS OF CLAIMS 28 & 30**

Claims 28 and 30 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano et al. and further in view of U.S. Patent No. 6,745,112 to Mori, “Floating-Point Computation Using a Microcontroller” by Randel et al., and “Programming and Customizing the PIC Microcontroller” by Predko.

**CLAIMS 28 & 30**

Claims 29 and 30 depend from claim 13, and they are therefore allowable for essentially the same reasons, since the secondary references do not cure – and are not asserted to cure – the critical deficiencies of the other applied references.

*As further regards all of the obviousness rejections, the Examiner did not provide specific evidence to establish those assertions and/or contentions that may be supported by any Official Notices under 37 C.F.R. § 1.104(d)(2) or otherwise. In particular, the Examiner did not provide an affidavit and/or provide published information concerning these assertions. (See also MPEP § 2144.03).*

Accordingly, claims 13 to 30 are allowable.

As further regards all of the obviousness rejections, it is respectfully submitted that the cases of In re Fine, supra, and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), make plain that the Office's generalized assertions that it would have been obvious to modify or combine the references do not properly support a § 103 rejection. It is respectfully submitted that those cases make plain that the Answer reflects a subjective “obvious to try” standard, and therefore does not reflect the proper evidence to support an obviousness rejection based on the references relied upon. In particular, the Court in the case of In re Fine stated that:

The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. This it has not done. . . .

**Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.**

In re Fine, 5 U.S.P.Q.2d at 1598 to 1600 (citations omitted; italics in original; emphasis added). Likewise, the Court in the case of In re Jones stated that:

Before the PTO may combine the disclosures of two or more



prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. . . .

**Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].**

In re Jones, 21 U.S.P.Q.2d at 1943, 1944 (citations omitted; italics in original).

That is exactly the case here since it is believed and respectfully submitted that the Office Actions to date and the Answer offer no evidence whatsoever, but only conclusory hindsight, reconstruction and speculation, which these cases have indicated does not constitute evidence that will support a proper obviousness finding. Unsupported assertions are not evidence as to why a person having ordinary skill in the art would be motivated to modify or combine references to provide the claimed subject matter of the claims to address the problems met thereby. Accordingly, the Office must provide proper evidence of a motivation for modifying or combining the references to provide the claimed subject matter.

Also, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a “technologically simple concept” — which is not the case here — there still must be some finding as to the “specific understanding or principle within the knowledge of a skilled artisan” that would motivate a person having no knowledge of the claimed subject matter to “make the combination in the manner claimed,” stating that:

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed. In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper *prima facie* case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000) (emphasis added). Here again, there have been no such findings to establish that the features discussed above of the rejected claims are met by the reference relied upon. As referred to above, any review of the reference, whether taken alone or combined, makes plain that the reference simply does not describe the features discussed above of the rejected claims.

As still further regards all of the obviousness rejections of the claims, it is respectfully submitted that a proper *prima facie* case has not been made in the present case for obviousness, since the Office Actions to date never made any findings, such as, for example, regarding in any way whatsoever what a person having ordinary skill in the art would have been at the time the claimed subject matter of the present application was made. (See In re Rouffet, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998) (the “factual predicates underlying” a *prima facie* “obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art”)).

It is respectfully submitted that the proper test for showing obviousness is what the “combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art”, and that the Patent Office must provide particular findings in this regard — the evidence for which does not include “broad conclusory statements standing alone”. (See In re Kotzab, 55 U.S.P.Q. 2d 1313, 1317 (Fed. Cir. 2000) (citing In re Dembiczak, 50 U.S.P.Q.2d 1614, 1618 (Fed. Cir. 1999) (obviousness rejections reversed where no findings were made “concerning the identification of the relevant art”, the “level of ordinary skill in the art” or “the nature of the problem to be solved”))). It is respectfully submitted that there has been no such showings by the Office Actions to date or by the Answer.

In fact, the present lack of any of the required factual findings forces both Appellants and this Appeals Board to resort to unwarranted speculation to ascertain exactly what facts underly the present obviousness rejections. The law mandates that the allocation of the proof burdens requires that the Patent Office provide the factual basis for rejecting a patent application under 35 U.S.C. § 103. (See In re Piasecki, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984) (citing In re Warner, 379 F.2d 1011, 1016, 154 U.S.P.Q. 173, 177 (C.C.P.A. 1967))). In short, the Examiner bears the initial burden of presenting a proper

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prima facie unpatentability case — which has not been met in the present case. (See *In re Oetiker*, 977 F.2d 1443, 1445, 24, U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992)).

Accordingly, claims 13 to 30 are allowable, and the rejections should therefore be reversed.

### **CONCLUSION**

In view of the above, it is respectfully requested that the rejections of the finally rejected claims 13 to 30 be reversed, and that these claims be allowed as presented.

Respectfully submitted,

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